Headquarters U.S. Air Force

Integrity - Service - Excellence

Air Force S&T Investment Strategy and Funding

Presented to the National Defense Industrial Association

(DoD Technology Exposition)

U.S. AIR FORCE

Dr. Don Daniel
Deputy Assistant Secretary
(Science, Technology & Engineering)
7 February 2002

U.S. AIR FORCE

Outline

- Introduction
- Funding
- Strategic Direction
- Investment Strategy Implications
- Conclusion

Air Force Science and Technology

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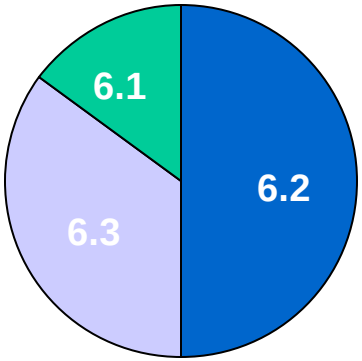
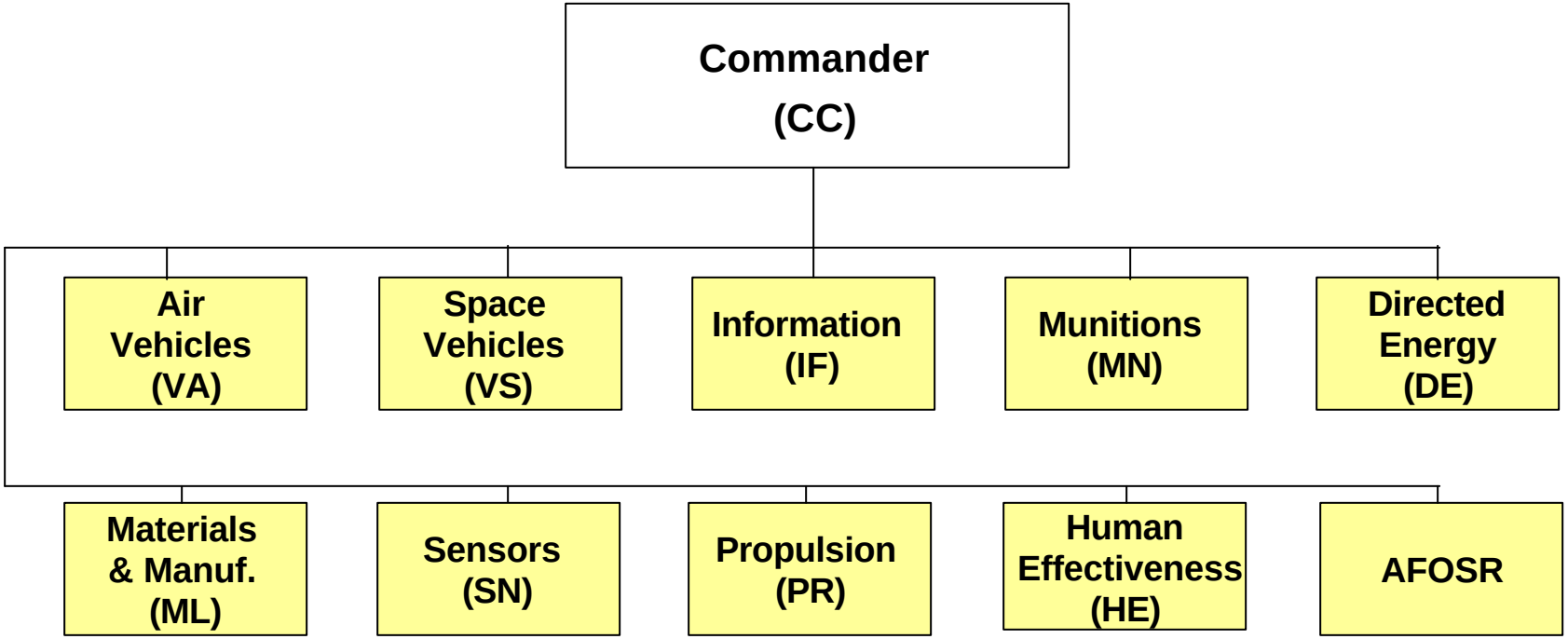
- Single line item in AF modernization budget
- Twenty-two program elements
  - Basic Research – 1 (61102F)
  - Applied Research – 10 (62xxxF)
  - Advanced Development – 11 (63xxxF)
- Thousands of Individual Projects
- Highly leveraged formal/informal partnerships/alliances
- Long-term in nature
- No guarantee of success



S&T Funding

Air Force Research Laboratory (AFRL) Organization

U.S. AIR FORCE



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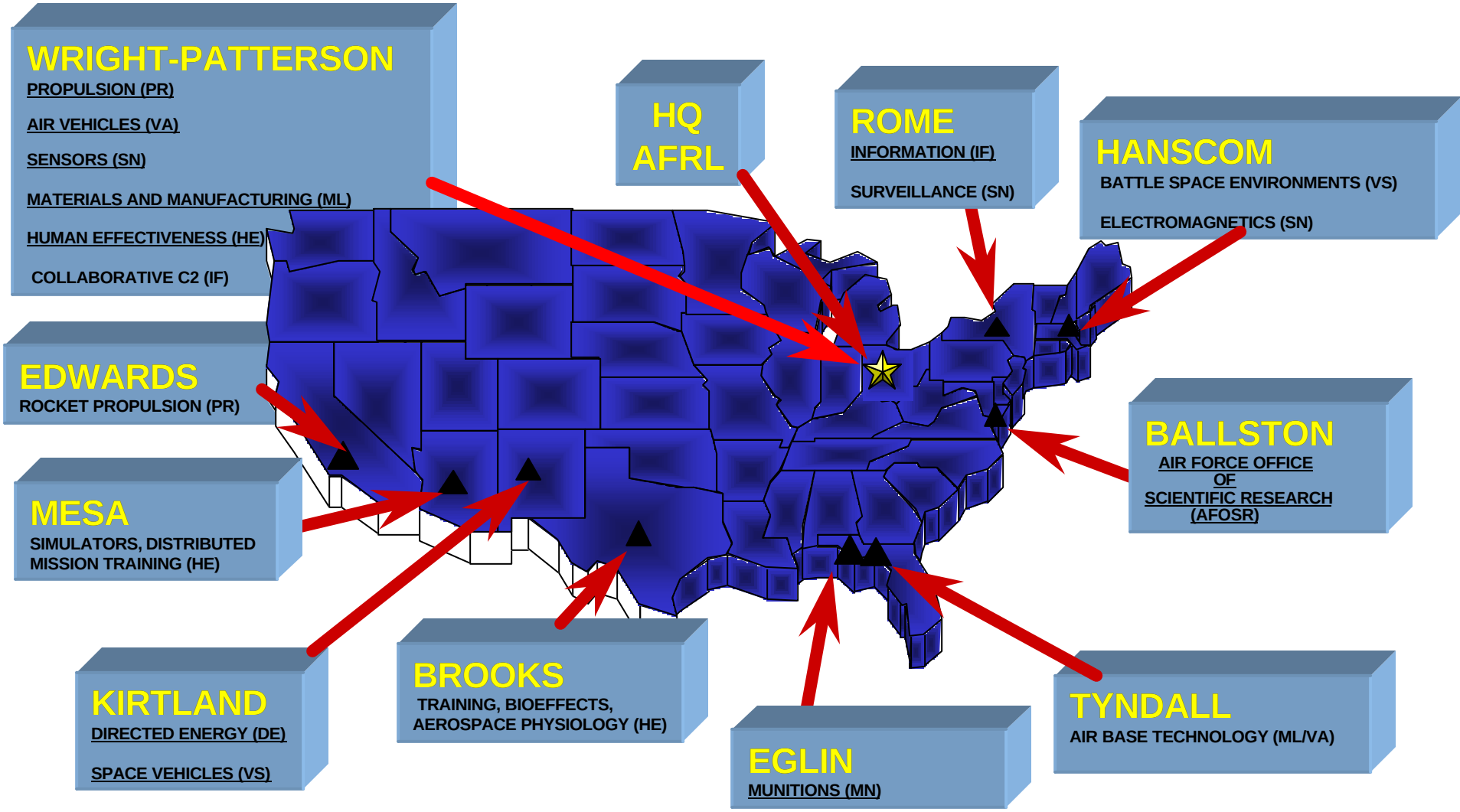
AFRL Major Sites and Technology Areas



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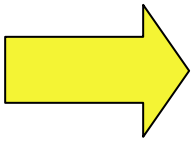
Outline



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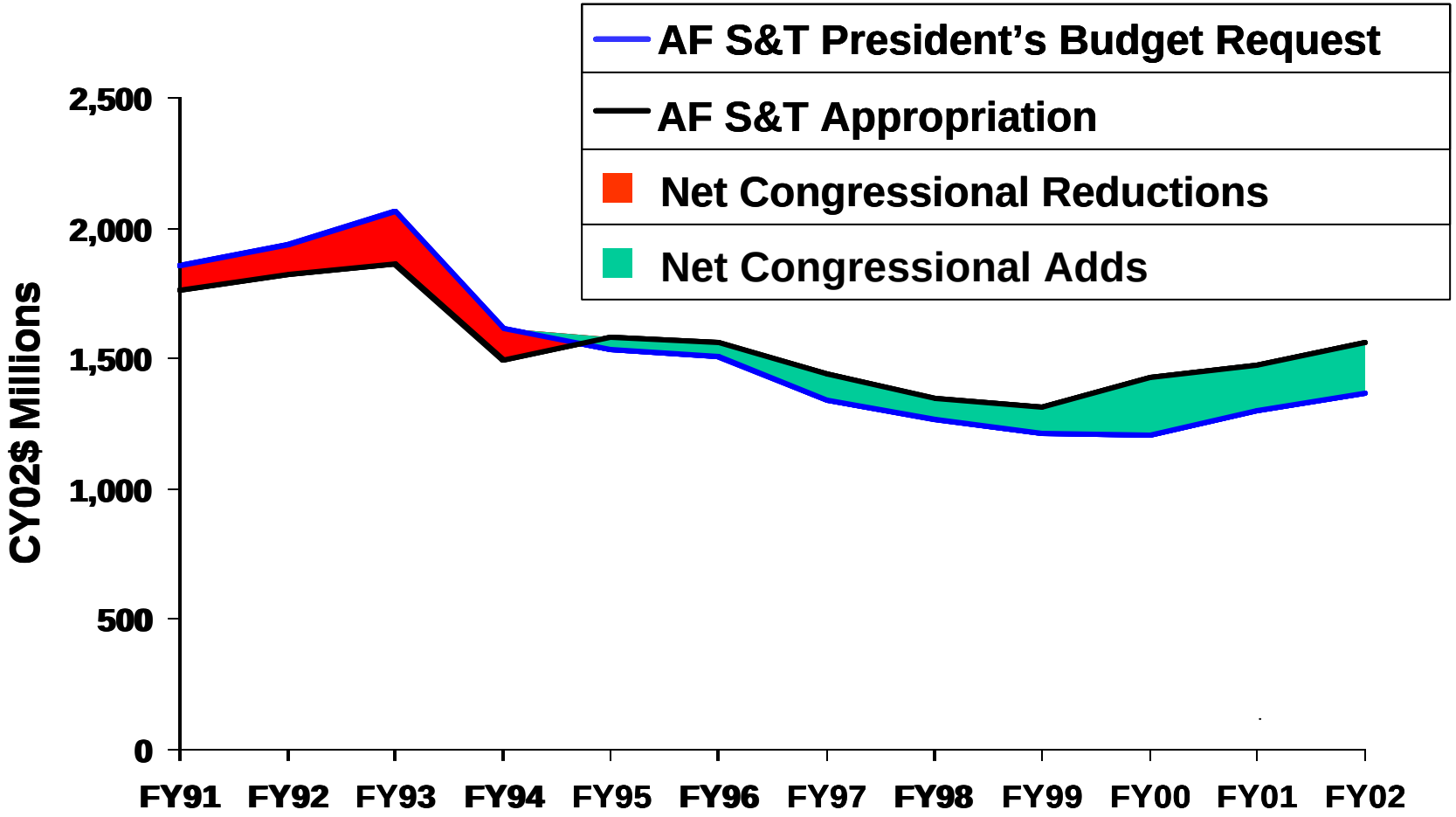
AF S&T Funding



Recent Air Force S&T Funding

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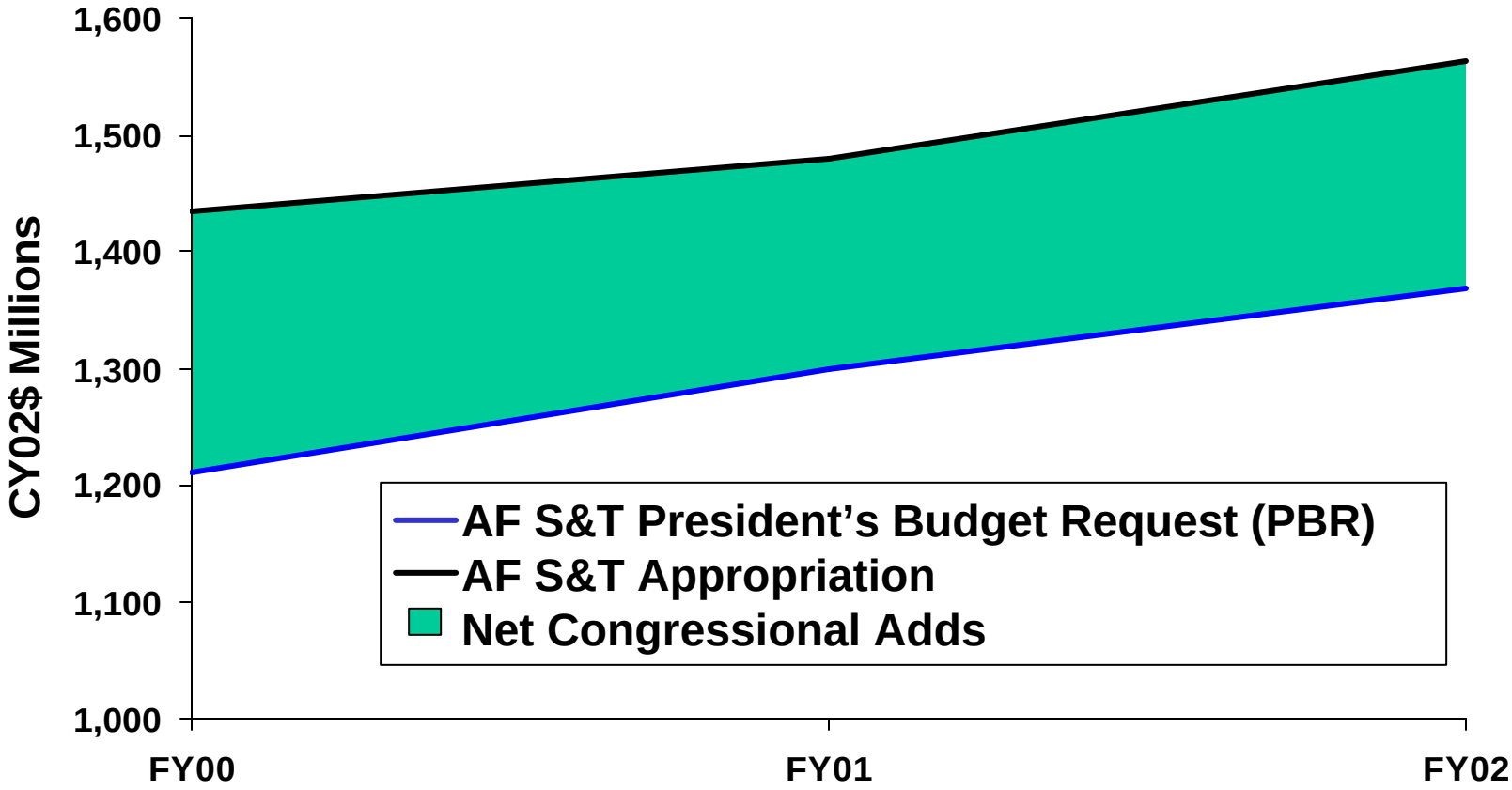


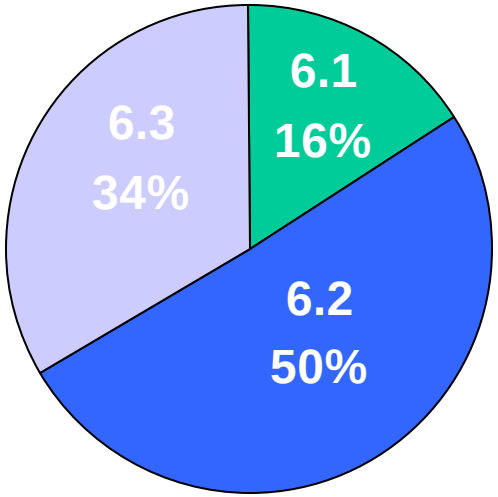
$197M PBR growth From 00-02
$592M Net Adds By Congress From 00-02

AF S&T By Budget Activity

U.S. AIR FORCE

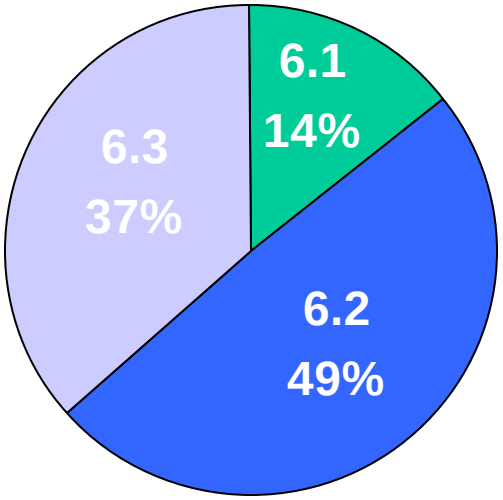
FY02

President's Budget Request



FY02

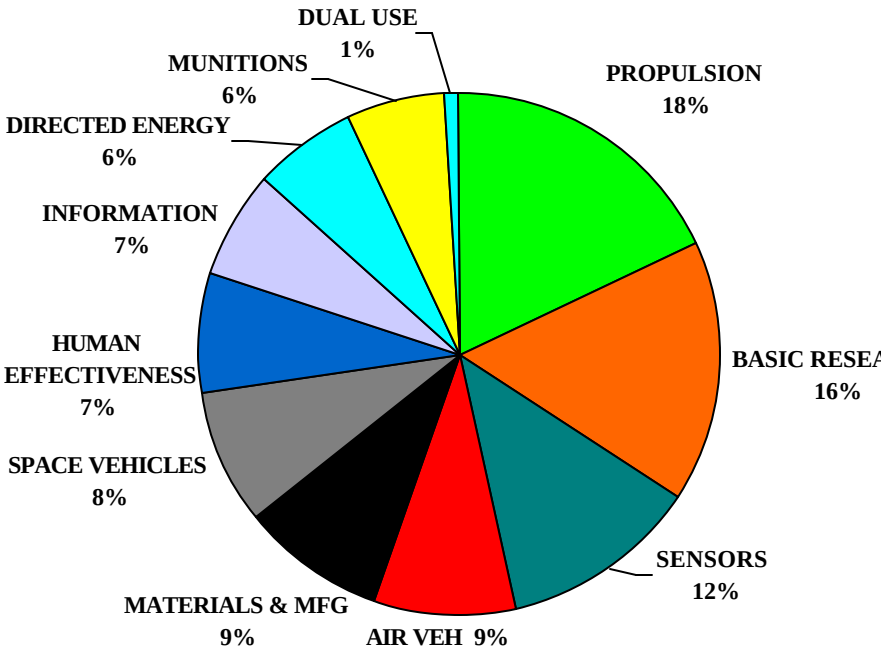
Appropriation



BUDGET ACTIVITY	FY02 PBR	FY02 APPN
6.1	220,869	228,419
6.2	694,192	772,129
6.3	464,769	577,667
TOTAL	**1,379,830**	**1,578,215**

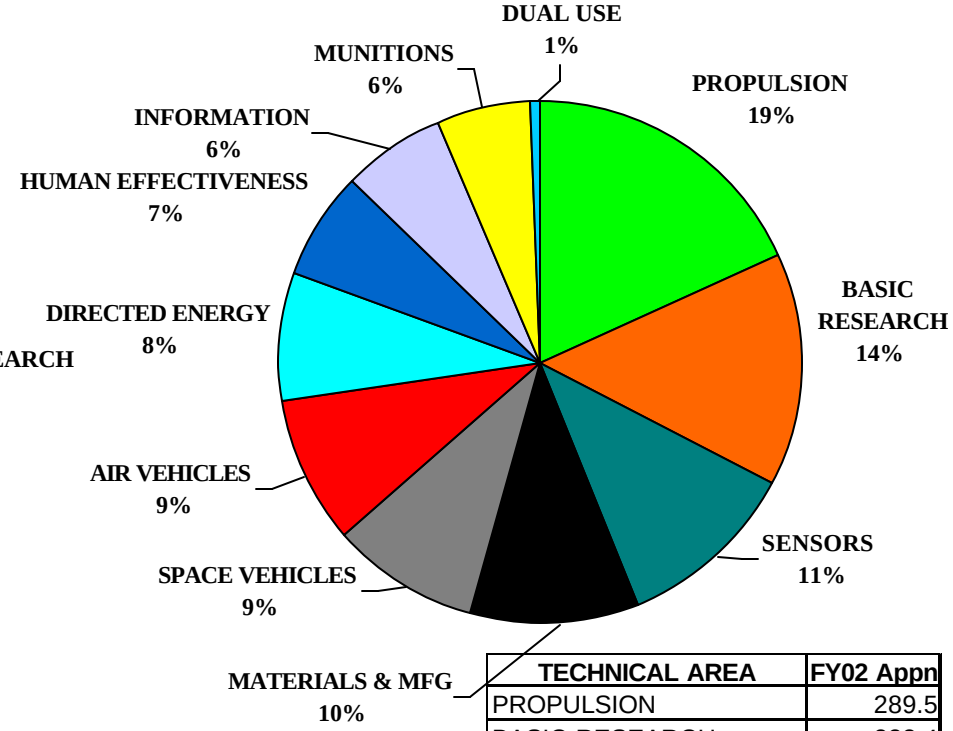
Air Force S&T FY02 Budget By Technical Area

U.S. AIR FORCE



TECHNICAL AREA	FY02 PB
PROPULSION	250.5
BASIC RESEARCH	220.9
SENSORS	168.2
AIR VEH	123.7
MATERIALS & MFG	123.0
SPACE VEHICLES	115.6
HUMAN EFFECTIVENESS	101.4
INFORMATION	92.0
DIRECTED ENERGY	86.9
MUNITIONS	86.9
DUAL USE	10.4
TOTAL	**1,379.8**

FY02 President's Budget Request



TECHNICAL AREA	FY02 Appn
PROPULSION	289.5
BASIC RESEARCH	228.4
SENSORS	174.4
MATERIALS & MFG	164.7
SPACE VEHICLES	142.7
AIR VEH	142.5
DIRECTED ENERGY	129.5
HUMAN EFFECTIVENESS	104.8
INFORMATION	101.9
MUNITIONS	89.4
DUAL USE	10.4
TOTAL	**1,578.2**

FY02 Appropriation

Numbers may not add due to rounding

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S&T Planning Review Direction

FY01 National Defense Authorization Act

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- **SECAF shall:**
  - **Conduct a review of the Air Force S&T programs**
  - **Identify long-term challenges**
  - **Identify short-term objectives**
- **Results:**
  - **Six Long-Term Challenges Identified**
  - **Eight Short-Term Objectives Identified**
  - **Air Force S&T Program focused on AF Vision 2020**
- **Comptroller General assess and report to Congress**

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Long-Term Challenge Definition

- **Characteristics of Long-Term Challenges**
  - **Compelling requirements of USAF**
  - **High Risk/High Payoff**
  - **Difficult but probably achievable**
  - **Not a linear extension of an ongoing program**
  - **20-50 year focus**

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Short-Term Objective Definition

- Characteristics of Short-Term Objectives
  - Compelling requirements of USAF
  - User support
  - Likely attainment in 5 years (matured to TRL-6)

S&T Challenges and Objectives Supporting the AF Vision

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- Target Location, ID, & Track
- C4I
- Precision Attack
- Space Control
- Access to Space
- Aircraft Survivability & CM
- Sustaining Aging Systems
- AEF Support

Global Vigilance, Reach and Power

AF Strategic Plan (14 Critical Capabilities)

Short-term Objectives

Long-term Challenges

Science & Technology Research

- Finding and Tracking
- Command and Control
- Controlled Effects
- Sanctuary
- Rapid Aerospace Response
- Effective Aerospace Persistence

Science & Technology -- key to achieving the Air Force Vision

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S&T Planning Framework

- Capabilities identified for each Challenge and Objective
  - Roadmaps developed for each capability
  - Capabilities prioritized by Warfighter
  - Brochure provides more information
    - Long-term challenges
    - Short-term objectives
    - Capabilities

41 Prioritized Enabling Capabilities tied to Air Force Vision

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S&T Investment Strategy

- Maintain Portfolio Balance
  - Basic Research - 15%
  - Applied Research - 50%
  - Advanced Technology Development - 35%

- Increase Leveraging of Strategic Partnerships/Alliances
  - DARPA
  - NASA

- Balance Investments with Transition Opportunities

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Primary Areas for Increased Emphasis

- Basic Research
  - Math and Computer Sciences
  - Physics
  - Materials
- Applied Research
  - Command, Control and Communication
  - Aerospace Vehicles
  - Directed Energy
- Advanced Technology Development
  - Command, Control and Communication
  - Advanced Weapons
  - Flight Vehicles

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Conclusion

- Diverse, highly leveraged, balanced program
- Significant funding increases for past three years
- Long-term challenges/Short-term objectives provide focus

S&T for the world's best Air Force

"Global Vigilance, Reach and Power"

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BACKUPS

U.S. AIR FORCE

Air Force S&T FY02 Budget Change Summary

TECHNICAL AREA	FY02 PB	Net Change*	FY02 Appn
PROPULSION	250.5	39	289
BASIC RESEARCH	220.9	8	228
SENSORS	168.2	6	174
MATERIALS & MFG	123.0	42	165
SPACE VEHICLES	115.6	27	143
AIR VEHICLES	123.7	19	142
DIRECTED ENERGY	86.9	43	130
HUMAN EFFECTIVENESS	101.4	3	105
INFORMATION	91.9	10	102
MUNITIONS	86.9	3	89
DUAL USE	10.4	0	10
TOTAL	**1,379.8**	**198**	**1,578**

* Changes due to Congressional Adds, Congressional Reductions, and Program Realignments

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Primary Areas for Increased Emphasis in Basic Research

- Math and Computer Sciences
  - Machine-Machine Info Sharing
  - Intelligent Agents
  - Cryptography
  - Intelligent Fusion and Communication Architecture
- Physics
  - Beamed Energy Production
  - Unconventional Energy Storage
  - Detection (Electromagnetic, Acoustic, Info Attack)
  - Active Photonic Beam Forming
- Materials
  - High Temperature Radiation Resistant Materials
  - High Energy Density Matter
  - Bucky Tubes
  - Advanced RF Materials

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Primary Areas for Increased Emphasis in Applied Research

- Command, Control and Communication
  - Precision Navigation
  - Advanced Fusion Systems
  - Enterprise Management
  - Intelligent Agents
- Aerospace Vehicles
  - Survivable Platforms
  - Integrated Vehicle Health Management
  - Micro Unmanned Air Vehicles
  - Thermal Protection Systems
- Directed Energy
  - Pulse Power Technology
  - Tactical Laser
  - Plasma Generation/Projection/Effects
  - High Efficiency Fiber Lasers

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Primary Areas for Increased Emphasis in Adv Tech Development

- Command, Control and Communication
  - Global Information Enterprise
  - Moving Time Critical Targets
  - Predictive Battlespace Awareness
  - Joint Battlespace Infosphere
- Advanced Weapons
  - Space Situation Awareness
  - Improved Force Protection
  - Directed Energy Weapons
  - Offensive Counterspace
- Flight Vehicles
  - Launch Vehicle System Technologies
  - High Energy Laser
  - Unmanned Combat Air Vehicle
  - Aging Aircraft Structures